Name: Date:

Polynomial Factoring solution (version 4)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 144}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-80}}{2}$$

$$x = \frac{-8 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-8 \pm 4\sqrt{5}\, i}{2}$$

$$x = -4 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 6i$ and $3 + 4i$ in standard form $(a + bi)$.**

Solution

$$(7 + 6i) \cdot (3 + 4i)$$

$$21 + 28i + 18i + 24i^2$$

$$21 + 28i + 18i - 24$$

$$21 - 24 + 28i + 18i$$

$$-3 + 46i$$

Polynomial Factoring solution (version 4)

3. **Write function $f(x) = x^3 + 9x^2 + 8x - 60$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	9	8	-60
-5		-5	-20	60
	1	4	-12	0

$$f(x) = (x + 5)(x^2 + 4x - 12)$$

$$f(x) = (x + 5)(x - 2)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 7)^2 \cdot (x + 4)^2 \cdot (x - 1)^2 \cdot (x - 5)$$

Sketch a graph of polynomial $y = p(x)$.